



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/003,861	11/02/2001	Dennis Rauschmayer	TI-32215	7437

7590 06/18/2004

Dennis Moore
Texas Instruments Incorporated
P.O. Box 655474
M/S 3999
Dallas, TX 75265

EXAMINER

NGUYEN, KHAI MINH

ART UNIT	PAPER NUMBER
----------	--------------

2684

DATE MAILED: 06/18/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/003,861

Applicant(s)

RAUSCHMAYER, DENNIS

Examiner

Khai M Nguyen

Art Unit

2684

– The MAILING DATE of this communication appears on the cover sheet with the correspondence address –

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 02 November 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-28 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 13, 14, 27, 28 is/are allowed.
- 6) ☒ Claim(s) 1-12 and 15-26 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-12, 15-26 rejected under 35 U.S.C. 103(a) as being unpatentable over Taylor (US-6700879) in view of Arviv (US-6549759).

Regarding claim 1, Taylor teaches a method of performing downstream adaptive modulation in an MMDS, broadband, fixed communication system having a base station with a transmitter-receiver and one or more CPE devices each having a transmitter-receiver (see fig.1; col.2, lines 42-47), the system utilizing a DOCSIS MAC pursuant to which the PDU is a variable length, Ethernet-type data packet (see fig.1; col.3, lines 17-30), which comprises:

operating the base station to transmit data downstream to the CPE devices in a plurality of data modulation modes (col.2, line 42 to col.3, line 16);

assigning one of the modulation modes to each respective CPE device (fig.1, col.2, lines 42-47);

monitoring the quality of downstream data transmission to, and reception by, each CPE device (fig.1; col.2, lines 42-47; col.3, lines 31-48); and

if the quality of downstream data transmission to and reception by any CPE device receiving data in its assigned modulation mode lies outside a predetermined quality range, assigning a different modulating mode to such CPE device, the different mode rendering the data transmission quality within the predetermined quality range (col.1, lines 14-20; col.1, line 55 to col.2, line 5).

Taylor does not explicitly show the communication system is a wireless system. However, it is well known in the art that communication system such as CPE can be a wireless system as evidenced by Arvin. Arvin discloses the wireless CPE (see Abstract, fig.2). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Taylor such that the CPE can be placed in the remote location without running wire to the remote location and a base station.

Regarding claim 2, Taylor teaches the method of claim 1, wherein:
the monitoring step is effected by monitoring and analyzing upstream messages from the CPE devices (fig.1, col.3, lines 31-48).

Regarding claim 3, Taylor teaches the method of claim 2, wherein:
the quality range is zero and is effectively a break point between acceptable and unacceptable quality, the predetermined quality range representing acceptable quality and, if the quality of downstream data transmission to and reception by any CPE device

receiving data in its assigned modulation mode is acceptable, no different modulation mode is assigned by the base station (fig.1, col.3, lines 31-48; col.4, lines 36-51).

Regarding claim 4, Taylor teaches the method of claim 2, wherein:

the quality range is non-zero and represents acceptable quality, quality higher than the range being superior and quality below the range being unacceptable, and assigning a higher quality modulation mode to the affected CPE device if its reception quality is unacceptable or assigning a lower quality modulation range to the affected CPE device if its reception quality is superior, and permitting the modulation mode of the CPE device to remain unchanged if its reception quality is acceptable (fig.1, col.3, lines 31-48; col.4, lines 36-51; col.1, line 55 to col.2, line 5).

Regarding claim 5, Taylor teaches the method of claim 1, wherein:

each data modulation mode is a QAM mode that includes a group of tones and has a selected transmission time (col.2, line 42 to col.3, line 16).

Regarding claim 6, Taylor teaches the method of claim 5, wherein the data modulation modes are $N_{sup.A}$ QAM tones, $N_{sup.B}$ QAM tones, $N_{sup.C}$ QAM tones . . . $N_{sup.Z}$ QAM tones, where $A < B < C < \dots < Z$ (col.2, line 42 to col.3, line 30).

Regarding claim 7, Taylor teaches the method of claim 6, wherein $N=4$, $A=0$, $B=A+1$, $C=B+1$. . . $Z=Y+1$ (col.2, line 42 to col.3, line 30).

Regarding claim 8, Taylor teaches the method of claim 5, wherein:
each tone group comprises a selected constellation density (col.2, line 42 to col.3, line 30).

Regarding claim 9, Taylor teaches the method of claim 8, wherein:
each tone group has a constant bit rate (col.2, line 42 to col.3, line 30; col.3, line 66 to col.4, line 35).

Regarding claim 10, Taylor teaches the method of claim 1, wherein: the assigning steps are effected by the base station transmitting downstream messages to the CPE devices (fig.1, fig.4, col.3, lines 31-48; col.6, line 1-40).

Regarding claim 11, Taylor teaches the method of claim 1, wherein:
the monitoring step is effected by the base station receiving and analyzing upstream ARQ messages transmitted by the CPE devices (col.4, lines 52-67).

Regarding claim 12, Taylor teaches the method of claim 1, wherein:
at any given time the base station transmits data simultaneously on all of the modulation modes, but each CPE device receives data only on the modulation mode then assigned thereto (fig.1,fig.7, col.2, lines 42-47; col.3, lines 31-48; col.6, lines 20-40).

Regarding claim 15, Taylor teaches apparatus for performing downstream adaptive modulation in an MMDS, broadband, fixed wireless communication system having a base station with a transmitter-receiver and one or more CPE devices each having a transmitter-receiver (fig.1, col.2, lines 42-47), the system utilizing a DOCSIS MAC pursuant to which the DPU is a variable length, Ethernet-type data packet (fig.1, col.3, lines 17-30), which comprises:

first facilities in the base station for transmitting data downstream to the CPE devices in a plurality of data modulation modes (col.2, line 42 to col.3, line 16);

second facilities in the base station for assigning a respective modulation mode to each respective CPE device (fig.1, col.2, lines 42-47);

third facilities in the base station for monitoring the quality of downstream data transmission to and reception by each CPE device (col.1, lines 14-20; col.1, line 55 to col.2, line 5); and

fourth facilities in the base station for determining if downstream data transmission quality to and reception by any CPE device receiving data in its assigned modulation mode lies outside a predetermined quality range for assigning a different modulating mode to such CPE device which different mode adjusts the data transmission quality to be within the predetermined quality range (col.1, lines 14-20, col.1, line 55 to col.2, line 5).

Regarding claim 16, Taylor teaches the apparatus of claim 15, wherein the third

facilities effect the monitoring step by monitoring and analyzing upstream messages from the CPE devices (fig.1, col.3, lines 31-48).

Regarding claim 17, Taylor teaches the apparatus of claim 16, wherein the quality range is zero and is effectively a break point between acceptable and unacceptable quality with the predetermined quality range representing acceptable quality, and if the quality of downstream data transmission to and reception by any CPE device receiving data in its assigned modulation mode is acceptable, the fourth facilities assign no different modulation mode (fig.1, col.3, lines 31-48, col.4, lines 36-51).

Regarding claim 18, Taylor teaches the apparatus of claim 16, wherein the quality range representing acceptable quality is non-zero, quality higher than the range is superior and quality below the range is unacceptable; and wherein the fourth facility: (i) assigns a higher quality modulation mode to the affected CPE device if its reception quality is unacceptable, (ii) assigns a lower quality modulation range to the affected CPE device if its reception quality is superior, and (iii) permits the modulation mode of the affected CPE device to remain unchanged if its reception quality is acceptable (fig.1, col.3, lines 31-48, col.4, line 36-51, col.1, line 55 to col.2, line 5).

Regarding claim 19, Taylor teaches the apparatus of claim 15, wherein each data modulation mode is a QAM mode that includes a group of tones and has a selected transmission time (col.2, line 42 to col.3, line 16).

Regarding claim 20, Taylor teaches the apparatus of claim 19, wherein the data modulation modes are N.sup.A QAM tones, N.sup.B QAM tones, N.sup.C QAM tones . . . N.sup.Z QAM tones, where $A < B < C < \dots < Z$ (col.2, line 42 to col.3, line 30).

Regarding claim 21, Taylor teaches the apparatus of claim 20, wherein $N=4$, $A=0$, $B=A+1$, $C=B+1$. . . $Z=Y+1$ (col.2, line 42 to col.3, line 30).

Regarding claim 22, Taylor teaches the apparatus of claim 19, wherein each tone group comprises a selected constellation density (col.2, line 42 to col.3, line 30).

Regarding claim 23, Taylor teaches the apparatus of claim 19, wherein each tone group has a constant bit rate (col.2, line 42 to col.3, line 30; col.3, line 66 to col.4, line 35).

Regarding claim 24, Taylor teaches the apparatus of claim 18, wherein the second facilities transmit training messages to the CPE devices in order to effect the assigning function (fig.1; fig.4; col.3, lines 31-48; col.6, line 1-40).

Regarding claim 25, Taylor teaches the apparatus of claim 18, wherein the third facilities receive and analyze the upstream ARQ messages transmitted by the CPE devices (col.4, lines 52-67).

Regarding claim 26, Taylor teaches the apparatus of claim 18, wherein at any given time the first facilities transmit data simultaneously on all of the modulation modes, but each CPE device receives data only on the modulation mode then assigned thereto (fig.1; fig.7; col.2, lines42-47; col.3, lines31-48; col.6, lines 20-40).

Allowable Subject Matter

2.Claim 13-14, 27-28 allowed.

The following is an examiner's statement of reasons for allowance: Prior art teaches a method and apparatus of performing downstream adaptive modulation in an MMDS, broadband, fixed wireless communication system having a base station with a first transmitter-receiver and one or more CPE devices each having a second transmitter-receiver, the system utilizing a DOCSIS MAC pursuant to which the DPU is a variable length, Ethernet-type data packet, which comprises : operating the base station to transmit data downstream to the CPE devices in a plurality of QAM modes each of which includes a group of tones, a predetermined transmission time, a predetermined constellation density and a constant bit rate; operating the base station to transmit training messages to the CPE devices to assign to each CPE device a selected one of the QAM modes. However, the prior art fails to teaches operating each CPE device to transmit ARQ messages to the base station when data is improperly received by such CPE device; operating the base station to monitor the quality of

downstream data transmission to and reception by each CPE device by receiving and analyzing ARQ messages, a predetermined number of ARQ messages from a given CPE device indicating that the quality of data transmission to such CPE device is acceptable, a number of ARQ messages greater than the predetermined number indicating unacceptable quality ; and assigning a higher quality QAM mode to any CPE device that transmits a number of ARQ messages greater than the predetermined number and assigning a lower quality QAM mode to any CPE device that transmits a number of ARQ messages less than the predetermined number.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Conclusion

3.The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

- a) Miner (US-6690655) discloses Low-powered communication system and method of operation.
- b) Shahr (Pub-20030002495) discloses Adaptive downstream modulation scheme for broadband wireless access systems.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Khai M Nguyen whose telephone number is 703.05.3906. The examiner can normally be reached on 8:00-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nay Maung can be reached on 703.308.7745. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Khai Nguyen
Au:2684
Date 6/2/2004


NAY MAUNG
SUPERVISORY PATENT EXAMINER